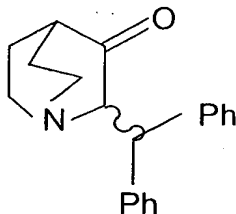


WHAT IS CLAIMED IS:

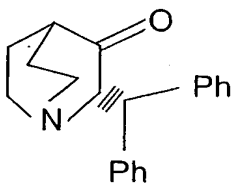
1. A process for preparing (S,S)-cis-2-benzhydryl-3-benzylaminoquinuclidine comprising the steps of:

5 contacting a compound containing a mixture of R- and S-isomers and having the formula



10 with an effective amount of a chiral organic acid in the presence of an organic solvent and an effective amount of an organic carboxylic acid for converting said R-isomer into an acid salt of said S isomer, said organic solvent being capable of solubilizing said compound containing said mixture of R- and S-isomers, while precipitating said acid salt and said organic carboxylic acid being different from said chiral organic acid;

neutralizing said acid salt with a base to provide an S-isomer of a chiral ketone of the formula



; and

15 reacting said chiral ketone with an organic amine in the presence of a Lewis acid to provide the corresponding imine and reducing said imine.

2. The process of Claim 1 wherein the compound is present as a racemic mixture.

20 3. The process of Claim 1 wherein said acid salt is a tartrate salt of (2S)-benzhydryl-3-quinuclidinone.

4. The process of Claim 1 wherein said chiral organic acid is L-tartaric acid.

5. The process of Claim 1 wherein said effective amount of said chiral organic acid employed is at least one equivalent or more.

6. The process of Claim 1 wherein said organic solvent is an alcohol.

25 7. The process of Claim 5 wherein said alcohol is ethanol.

8. The process of Claim 6 wherein said alcohol is a denatured alcohol.

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9. The process of Claim 1 wherein said organic carboxylic acid is acetic acid, propionic acid or butyric acid.
10. The process of Claim 9 wherein said organic carboxylic acid is acetic acid.
11. The process of Claim 1 wherein said effective amount of said organic
5 carboxylic acid employed is at least one equivalent, relative to said compound.
12. The process of Claim 1 wherein said base is sodium bicarbonate, potassium bicarbonate, sodium carbonate, potassium carbonate, sodium hydroxide or potassium hydroxide.
13. The process of Claim 1 wherein said base is added with cooling to maintain a
10 temperature below 25°C until reaching a pH of about 9.
14. The process of Claim 1 wherein said neutralizing is performed in the presence of a biphasic solvent mixture.
15. The process of Claim 14 wherein said biphasic solvent mixture comprises a second organic solvent and water.
- 15 16. The process of Claim 15 wherein said second organic solvent is toluene, ethyl acetate, or methyl t-butyl ether.
17. The process of Claim 1 wherein said Lewis acid is an aluminum salt.
18. The process of Claim 16 wherein said aluminum salt is aluminium triisopropoxide.
- 20 19. The process of Claim 1 wherein said Lewis acid is a titanium salt.
20. The process of Claim 19 wherein said titanium salt is titanium tetra-
isopropoxide.
21. The process of Claim 1 wherein at least one equivalent or more of said Lewis acid is employed relative to the S isomer of the chiral ketone.
- 25 22. The process of Claim 1 wherein said imine is reduced by reacting the same with a reducing agent in the presence of a noble metal catalyst.
23. The process of Claim 22 wherein said noble metal catalyst is a supported palladium or a supported platinum catalyst.
24. The process of Claim 22 wherein said noble metal catalyst is platinum on
30 carbon.
25. The process of Claim 22 wherein said reducing agent is hydrogen.
26. The process of Claim 1 wherein said organic amine is an arylalkylamine.
27. The process of Claim 26 wherein said arylalkylamine is benzylamine.
28. The process of Claim 1 wherein said acid salt is produced in a yield greater
35 than 50%
29. The process of Claim 28 wherein said yield is from 85 to 90 %.

30. The process of Claim 1 wherein said imine is reduced immediately following formation of the same.

31. A salt of 2(S)-benzhydryl-3-quinuclidinone, said salt being substantially
5 enantiomerically pure.

32. The salt of Claim 30 which is the tartrate salt.

33. A substantially enantiomerically pure 2(S)-benzhydryl-3-quinuclidinone.

34. A substantially enantiomerically pure imine of 2(S)-benzhydryl-3-quinuclidinone.